

REMARKS

Claims 1, 11-15, 17, 18 and 26-29 are amended. Claim 9 is canceled. Claims 1-8 and 10-64 are in the application for consideration.

All claims stand rejected as being either anticipated or obvious over U.S. Patent No. 7,098,131 to Kang et al. However, the '131 Kang et al. patent is not prior art to this patent application. Specifically, the instant application was filed on August 18, 2003, and the patent application which became the '131 Kang et al. patent was filed after this date. Accordingly, the '131 Kang et al. patent upon which the Examiner relies is not prior art, and all rejections thereover must be withdrawn.

Applicant recognizes that U.S. Patent Application Serial No. 10/196,814 is referenced in the Kang et al. patent, and is indicated as having a filing date prior to the filing date of Applicant's application. It is further noted that the application which became the '131 Kang et al. patent was a continuation-in-part application of the 10/196,814 application. Applicant herewith discloses the 10/196,814 application in an accompanying Supplemental Disclosure Statement, and refers to such in arguing allowability thereover below.

Claim 9 has been canceled, and is essentially written into independent form in claim 1. Claim 13 is also rewritten into independent form. Claim 1 recites that the second precursor plasma is void of hydrogen, and claim 13 recites that the second precursor plasma comprises CO. Neither of such is disclosed in the 10/196,814 application. The only second reactants

disclosed in the '814 Kang et al. reference can be found at p.6, Ins.21-24, and consist of H₂, NH₃, SiH₄, or Si₂H₆. Clearly, the only commonality among the four listed materials is the presence of hydrogen. The reference clearly does not suggest utilizing a second precursor plasma which is void of hydrogen, nor does such suggest using a second precursor plasma that comprises CO. The Examiner merely asserts at p.4 of the last Office Action that Applicant's claimed "removers" are known in the art to perform the stated function, and that Applicant must evidence unexpected results. Applicant disagrees. The Examiner has cited no prior art with respect to that which Applicant recites in either claims 1 or 13 as herein amended. Accordingly, the Examiner is apparently relying upon such as being notorious within the prior art, and Applicant hereby challenges the Examiner to produce a prior art reference evidencing such or to provide an affidavit of the Examiner on the record to such effect. Absence such, the Examiner's rejection in this regard must be withdrawn as there is no evidence on the record that such is indeed "known in the art" as asserted by the Examiner. Accordingly for at least this reason on the present record, Applicant's amended independent claims 1 and 13 should be allowed, and action to that end is requested.

Claim 17 is rewritten into independent form and recites that the chemisorbing with the first species is void of plasma, and that the method further comprises feeding the second precursor to the chamber in the absence of plasma during the chemisorbing. The '814 Kang et al. reference

is completely silent in this regard, and there is absolutely no suggestion of doing that which Applicant recites in claim 17. (While the '131 Kang et al. patent, which is not prior art, discloses feeding a combination of TAIMATA with a reacting gas at col.9, ln.31 - col.10, ln.3, such is in the context of CVD, not ALD. Accordingly, such is not occurring during Applicant's claim-recited chemisorbing, and the Examiner's anticipation rejection thereover is fundamentally in error even were the '131 Kang et al. patent prior art, which it is not.)

Claim 18 is rewritten into independent form, and recites that the second precursor plasma is generated from feeding the second precursor to the deposition chamber with plasma power being applied to the second precursor within the deposition chamber. The '814 Kang et al. patent application in no way discloses such, and specifically teaches against doing so. See for example p.8, lns. 23-27 wherein process parameters associated with plasma in the chamber are stated to be "excluded". As the '814 Kang et al. reference doesn't disclose and teaches against that which Applicant recites in claim 18, no rejection of claim 18 over the '814 patent application would be appropriate.

Claim 26 is rewritten into independent form and recites that pressure within the chamber during the chemisorbing is lower than during the contacting. The '814 Kang et al. patent clearly only teaches that its process is carried out at constant pressure (p.6, lns.25, 26). The Examiner asserts that with respect to "constant pressure" that such is a well-known result

effective variable and that Applicant must show unexpected results garnered from the variable. Without necessarily agreeing to the Examiner's assertion, Applicant has indicated in paragraph [0024] that best conductivity results were obtained when pressure during the chemisorbing with the first precursor is lower than it is during contacting with the second precursor. There is absolutely no disclosure or suggestion that a pressure change would result in optimization of conductivity, and accordingly Applicant does show unexpected results obtained from the stated pressure relationship, although obtaining such improved conductivity is in no way required by claim 26. For the foregoing reasons, Applicant's claim 26 should be allowed, and action to that end is requested.

Claim 29 is rewritten into independent form and recites that metal atoms are present in the conductive metal nitride at an atomic ratio of metal atoms to nitrogen atoms at great than 1:1. Such is neither shown nor suggested in the '814 application, and in fact the exact opposite is suggested. Specifically, the undersigned does not find any locations within the '814 application where specific content of metal atoms to nitrogen atoms are provided, with the disclosed stoichiometry only being shown as 1:1. Further, even the '131 Kang et al. patent (which is not prior art) in Table 1 discloses greater nitrogen content as compared to the metal in a tantalum nitride layer. Also, the '814 Kang et al. application at p.7, ln.31 - p.8 ln.10 indicates that nitrogen atoms are not affected by the removal gas due to double bonding with the elemental metal. Thereby, the '814 Kang et al.

application clearly teaches away from formation of a metal nitride layer having greater metal content than nitrogen content. Accordingly, Applicant's amended claim 29 should be allowed, and action to that end is requested.

Applicant's independent claim 36, among other limitations, recites feeding the second precursor to the deposition chamber with plasma power being applied to the second precursor within the deposition chamber. As argued above, the '814 Kang et al. application neither discloses nor suggests such. Accordingly, independent claim 36 as-presented should be allowed, and action to that end is requested.


Applicant's remaining dependent claims should be allowed as depending from allowable base claims, and for their own recited features which are neither shown nor suggested in the cited art. Action to that end is requested.

It is respectfully asserted that the Examiner is precluded from making any next office action final with respect to any prior art rejection at least due to the fact that the '131 Kang et al. patent not being prior art and clearly including language upon which the Examiner apparently relied in rejecting Applicant's claim which is not included in the '814 Kang et al. patent application.

Regardless, this application is believed to be in immediate condition for allowance, and action to that end is requested.

Respectfully submitted,

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